CLAIMS

1. A turbine blade having opposing pressure and suction side walls adjoining at leading and trailing edges of the blade, and defining at least one internal channel providing a flow passage for a cooling medium, said at least one channel including a plurality of turbulence promoting ribs mounted on a channel wall surface, wherein each rib comprises two rib portions joined at one end thereof to form a chevron junction, said chevron junction defining an angle of between 80° and 120° between the two rib portions and being directed into the flow of the cooling medium within the at least one channel, and wherein at least one gap is provided in one rib portion, and at least one gap is provided in the other rib portion.

2. A turbine blade as claimed in claim 1, wherein one rib portion is disposed at an angle of 120° from the other rib portion.

3. A turbine blade as claimed in claim 1 or 2, wherein the at least one channel has a substantially triangular cross-section.

4. A turbine blade as claimed in claim 1 or 2, wherein the at least one channel has a substantially circular cross-sectional shape.

5. A turbine blade as claimed in any preceding claim, wherein adjacent ribs are aligned such that adjacent chevron junctions are longitudinally aligned with respect to the at least one channel.

6. A turbine blade as claimed in any one of claims 1 to 4, wherein adjacent ribs are misaligned such that adjacent chevron junctions are longitudinally offset.

7. A turbine blade as claimed in any preceding claim, wherein the ribs are mounted on opposing sides of the at least one channel.

8. A turbine blade as claimed in claim 7, wherein each opposing rib is laterally aligned with respect to the at least one channel.

9. A turbine blade as claimed in claim 7, wherein each opposing rib is laterally offset with respect to the at least one channel.

10. A turbine blade as claimed in any preceding claim, wherein the gaps of each adjacent rib are longitudinally aligned with respect to the at least one channel.

11. A turbine blade as claimed in any one of claims 1 to 9, wherein the gaps in each adjacent rib are longitudinally offset with respect to the at least one channel.

12. A turbine blade as claimed in any preceding claim, wherein the centre of the at least one gap is located between 60% and 70% along the length of a respective rib portion from the chevron junction.

13. A turbine blade as claimed in any preceding claim, wherein the centre of the at least one gap is located

around two thirds along the length of a respective rib portion from the chevron junction.

14. A turbine blade as claimed in any preceding claim, wherein at least one of the ribs extends substantially perpendicular from the surface of the at least one channel.

15. A turbine blade as claimed in an preceding claim, wherein at least one of the ribs extends from the surface of the at least one channel at an angle of between 45° to 135° with respect to the direction of flow through the at least one channel.

16. A turbine blade as claimed in any preceding claim, wherein at least one of the ribs extends at an angle of between 60° to 90° from the surface of the at least one channel with respect to the direction of flow therethrough.

17. A turbine blade as claimed in any preceding claim, wherein at least one of the ribs extends at an angle of between 62° to 79° from the surface of the at least one channel with respect to the direction of flow therethrough.

18. A turbine blade as claimed in any preceding claim, wherein the ribs have a trapezoidal cross-section.

19. A turbine blade as claimed in any preceding claim, wherein the ribs have a cross-section in the form of a parallelogram.

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20. A turbine blade as claimed in any preceding claim, wherein the ribs have a square cross-section.

21. A turbine blade as claimed in any preceding claim, wherein adjacent ribs are spaced apart by between 4 and 6 mm.

22. A turbine blade as claimed in any preceding claim, wherein adjacent ribs are spaced apart by between 4 and 5 mm.

23. A turbine blade as claimed in any preceding claim, wherein adjacent ribs are spaced apart by 4.4 mm.

24. A turbine blade as claimed in any preceding claim, wherein the ribs have a height of between 0.45 and 0.75 mm.

25. A turbine blade as claimed in any preceding claim, wherein the ribs have a height of between 0.5 and 0.6 mm.

26. A turbine blade as claimed in any preceding claim, wherein the ribs have a height of 0.52 mm.

27. A turbine blade as claimed in any preceding claim, wherein the ribs have a width of between 0.45 and 0.75 mm.

28. A turbine blade as claimed in any preceding claim, wherein the ribs have a width of 0.6 mm.

29. A turbine blade as claimed in any preceding claim, wherein the gaps in the ribs are between 0.45 and 0.75 mm wide.

30. A turbine blade as claimed in any preceding claim, wherein the gaps in the ribs are 0.54 mm wide.

31. A turbine blade as claimed in any preceding claim, wherein the at least one channel is located in the region of the leading edge of the blade.

32. A turbine blade as claimed in any preceding claim, wherein the at least one channel is defined by the pressure wall, the suction wall and a web portion extending between the pressure and suction walls.

33. A turbine blade as claimed in any preceding claim, wherein the ribs are located in at least one channel in the region of the leading edge of the blade, such that one rib portion is located on the pressure wall, and the other rib portion is located on the suction wall, and the chevron junction is aligned with the leading edge.

34. A turbine blade as claimed in any one of claims 1 to 30, wherein the at least one channel is located in a mid-passage of the blade, between the leading and trailing edges of the blade.

35. A turbine blade as claimed in any preceding claims, wherein the blade includes a plurality of internal channels.

36. A turbine blade as claimed in claim 35, wherein at least one of the plurality of channels is located in the region of the leading edge of the blade, and at least one channel is located in a mid-passage of the blade, between the leading and trailing edges.

37. A turbine blade as claimed in any preceding claim, wherein the at least one channel is of a single pass form.

38. A turbine blade as claimed in any one of claims 1 to 36, wherein the at least one channel is of a serpentine form.

39. A turbine blade as claimed in any preceding claim, wherein the turbine blade further includes a root portion and a tip portion, wherein the pressure and suction walls and the leading and trailing edges extend from the root portion to the tip portion of the blade.

40. A turbine blade as claimed in claim 39, wherein the cooling medium is supplied to the blade via the root portion.

41. A turbine blade as claimed in claim 39 or 40, wherein the root portion is of a fir-tree type.

42. A turbine blade as claimed in claim 39 or 40, wherein the root portion is of a dove tail type.

43. A turbine blade as claimed in any preceding claim, wherein the external surface of the turbine blade defines a plurality of apertures providing fluid communication

between the at least one cooling channel and the exterior of the blade.

44. A turbine blade as claimed in any preceding claim, wherein the cooling medium is air.

45. A turbine blade as claimed in any preceding claim, wherein the cooling medium is compressed air fed from a compressor.

46. A turbine blade as claimed in any preceding claim, wherein the turbine blade is a rotor blade of a gas turbine engine.

47. A turbine blade as claimed in any preceding claim, wherein the blade is a first stage rotor blade of a gas turbine engine.

48. A turbine blade as claimed in any one of claims 1 to 45, wherein the turbine blade is a stator blade of a gas turbine engine.

49. A gas turbine engine including a plurality of turbine blades, at least one turbine blade having opposing pressure and suction side walls adjoining at leading and trailing edges of the blade, and defining at least one internal channel providing a flow passage for a cooling medium, said at least one channel including a plurality of turbulence promoting ribs mounted on a channel wall surface, wherein each rib comprises two rib portions joined at one end thereof to form a chevron junction, said chevron junction defining an angle of between 80° and 120° between the two rib portions and

being directed into the flow of the cooling medium within the at least one channel, and wherein at least one gap is provided in one rib portion, and at least one gap is provided in the other rib portion.

50. Electrical generating means including a gas turbine engine, said gas turbine engine including a plurality of turbine blades, at least one turbine blade having opposing pressure and suction side walls adjoining at leading and trailing edges of the blade, and defining at least one internal channel providing a flow passage for a cooling medium, said at least one channel including a plurality of turbulence promoting ribs mounted on a channel wall surface, wherein each rib comprises two rib portions joined at one end thereof to form a chevron junction, said chevron junction defining an angle of between 80° and 120° between the two rib portions and being directed into the flow of the cooling medium within the at least one channel, and wherein at least one gap is provided in one rib portion, and at least one gap is provided in the other rib portion.

51. A turbine blade having opposing pressure and suction side walls adjoining at leading and trailing edges of the blade, and defining at least one internal channel providing a flow passage for a cooling medium, said at least one channel including a plurality of turbulence promoting ribs mounted on a channel wall surface, wherein at least one rib has a trapezoidal cross-sectional shape and extends from the channel wall surface at an angle greater than 60° and less than 90°, such that said at least one rib is directed into the direction of flow of the cooling medium within the at least one channel.

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52. A turbine blade as defined in claim 51, wherein the at least one rib extends from the channel wall surface at an angle of between 62° and 79°.

53. A turbine blade as defined in claim 51 or 52, wherein the cross-sectional shape of the at least one rib is defined by a base and a tip joined by two flanks aligned parallel to each other.

54. A turbine blade having opposing pressure and suction side walls adjoining at leading and trailing edges of the blade, and defining at least one internal channel providing a flow passage for a cooling medium, said at least one channel including a plurality of turbulence promoting ribs mounted on a channel wall surface, wherein at least one rib has a cross-sectional shape in the form of a parallelogram and extends from the channel wall surface at an angle greater than 60° and less than 90°, such that said at least one rib is directed into the direction of flow of the cooling medium within the at least one channel.

55. A turbine blade as defined in claim 54, wherein the at least one rib extends from the channel wall surface at an angle of between 62° and 79°.